

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a first semiconductor layer and a second semiconductor layer on an insulating surface;

5 a first insulating film on the first semiconductor layer and on the second semiconductor layer;

a gate wiring on the first insulating film, overlapping the first semiconductor layer;

10 a capacitor wiring on the first insulating film, positioned over the second semiconductor layer;

an island shape source wiring on the first insulating film;

15 a second insulating film covering the gate wiring, the capacitor wiring, and the island shape source wiring;

a connection electrode on the second insulating film, connected to the island shape source wiring and the first semiconductor layer; and

20 a pixel electrode on the second insulating film, connected to the first semiconductor layer;

wherein the pixel electrode overlaps the island shape source wiring with the second insulating film interposed therebetween.

25 2. A device according to claim 1, wherein:

a plurality of the island shape source wirings are arranged in each pixel;

and

the island shape source wirings are each connected to the connection

25 electrodes.

3. A device according to claim 1, wherein the pixel electrode overlaps the gate wiring with the second insulating film interposed therebetween.

4. A device according to claim 1, wherein the gate wiring is formed from a film  
5 having an element selected from the group consisting of: polysilicon doped with an impurity element which imparts one conductivity; W; WSix; Al; Cu; Ta; Cr; and Mo as its main constituent, and a lamination film of the elements.

5. A device according to claim 1, wherein the second insulating film is composed  
10 of a first insulating layer having silicon as its main constituent, and a second insulating layer comprises an organic resin material.

6. A device according to claim 1, wherein the semiconductor device is a reflecting  
type liquid crystal display device.  
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7. A device according to claim 1, wherein the semiconductor device is a device  
selected from the group consisting of a personal computer, a video camera, a portable  
information terminal, a digital camera, a digital video disk player, and an electronic  
amusement device.  
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8. A semiconductor device comprising a first substrate, a second substrate, and  
a liquid crystal maintained between the joined first substrate and second substrate,  
wherein:  
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a pixel portion having a thin film transistor, and a driver circuit having a thin  
film transistor are formed on the first substrate;

the pixel portion has a semiconductor layer, a first insulating film covering the semiconductor layer, wirings on the first insulating film, a second insulating film covering the wirings, and electrodes on the second insulating film;

a red color filter, a blue color filter, and a green color filter corresponding

5 to each pixel of the pixel portion are formed on the second substrate; and

a lamination film of the red color filter and the blue color filter on the second substrate becomes a light shielding film overlapping the thin film transistor on the first substrate.

10 9. A device according to claim 8, wherein the wirings are a gate wiring, an island shape source wiring, and a capacitor wiring.

15 10. A device according to claim 9, wherein a storage capacitor having the first insulating film as a dielectric is formed in a region in which the capacitor wiring and the semiconductor layer overlap, sandwiching the first insulating film therebetween.

11. A device according to claim 9, wherein the electrodes are a pixel electrode connected to the semiconductor layer, and a connection electrode connected to the island shape source wiring.

20 12. A device according to claim 8, wherein a gap between the first substrate and the second substrate is maintained by a spacer composed of a lamination film of the red color filter, the blue color filter, and the green color filter.

25 13. A device according to claim 9, wherein the gate wiring is formed from a film

having an element selected from the group consisting of: polysilicon doped with an impurity element which imparts one conductivity; W; WSix; Al; Cu; Ta; Cr; and Mo as its main constituent, and a lamination film of the elements.

5        14. A device according to claim 8, wherein the second insulating film is composed of a first insulating layer having silicon as its main constituent, and a second insulating layer comprising an organic resin material.

10      15. A device according to claim 8, wherein the semiconductor device is a reflecting type liquid crystal display device.

15      16. A device according to claim 8, wherein the semiconductor device is a device selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player, and an electronic amusement device.

17. A semiconductor device comprising:  
a first semiconductor layer and a second semiconductor layer on an insulating surface;  
a first insulating film on the first semiconductor layer and on the second semiconductor layer;  
a first electrode on the first insulating film, overlapping the first semiconductor layer;  
a second electrode on the first insulating film, overlapping the second semiconductor layer;

a source wiring on the first insulating film;  
a second insulating film covering the first electrode and the source  
wiring;

5        a gate wiring on the second insulating film, connected to the first  
electrode;

a connection electrode on the second insulating film, connected to the source  
wiring and the first semiconductor layer; and

10        a pixel electrode on the second insulating film, connected to the first  
semiconductor layer;

10        wherein the pixel electrode overlays the source wiring with the second  
insulating film interposed therebetween.

15        18. A device according to claim 17, wherein the first electrode overlapping the  
first semiconductor layer is a gate electrode.

15        19. A device according to claim 17, wherein a storage capacitor is formed by the  
second semiconductor layer connected to the pixel electrode, and the second electrode  
connected to a gate wiring of an adjacent pixel, with the first insulating film as a  
dielectric.

20        20. A device according to claim 17, wherein:

the first semiconductor layer contains an impurity element which imparts  
one conductivity into the semiconductor; and

25        the second semiconductor layer contains an impurity element which imparts  
one conductivity, opposite to that contained in the first semiconductor layer, into the

semiconductor.

21. A device according to claim 17, wherein the gate wiring is formed from a film having an element selected from the group consisting of: polysilicon doped with an 5 impurity element which imparts one conductivity; W; WSix; Al; Cu; Ta; Cr; and Mo as its main constituent, and a lamination film of the elements.

22. A device according to claim 17, wherein the second insulating film is composed of a first insulating layer having silicon as its main constituent, and a second 10 insulating layer comprising an organic resin material.

23. A device according to claim 17, wherein the semiconductor device is a reflecting type liquid crystal display device.

15 24. A device according to claim 17, wherein the semiconductor device is a device selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player, and an electronic amusement device.

20 25. A semiconductor device comprising TFT containing a semiconductor layer formed on an insulating surface, an insulating film formed on the semiconductor layer, and a gate electrode formed on the insulating film, wherein:

the gate electrode has a first conductive layer with a tapered shape edge portion as a lower layer, and a second conductive layer having a narrower width than 25 that of the first conductive layer as an upper layer; and

the semiconductor layer includes: a channel forming region overlapping the second conductive layer, sandwiching the insulating film therebetween; a third impurity region formed contacting the channel forming region; a second impurity region formed contacting the third impurity region; and a first impurity region formed contacting the 5 second impurity region.

26. A device according to claim 25, wherein the third impurity region overlaps the first conductive layer with the insulating film interposed therebetween.

10 27. A device according to claim 25, wherein the first impurity region is a source region or a drain region.

15 28. A device according to claim 25, wherein a region of the insulating film which overlaps with the second impurity region contains a portion having a tapered shape.

29. A device according to claim 25, wherein the TFT is an n-channel TFT.

30. A device according to claim 25, wherein the TFT is a p-channel TFT.

20 31. A device according to claim 25, wherein the semiconductor device is a reflecting type liquid crystal display device.

25 32. A device according to claim 25, wherein the semiconductor device is a device selected from the group consisting of a personal computer, a video camera, a portable information terminal, a digital camera, a digital video disk player, and an electronic

amusement device.

33. A method of manufacturing a semiconductor device, comprising steps of:
- 5 forming a first semiconductor layer and a second semiconductor layer, made of crystalline semiconductor films, on an insulating surface;
- forming a first insulating film on the first semiconductor layer and on the second semiconductor layer;
- 10 forming a gate wiring on the first insulating film, overlapping the first semiconductor layer; a capacitor wiring on the first insulating film, positioned over the second semiconductor layer; and an island shape source wiring on the first insulating film;
- 15 forming a second insulating film covering the gate wiring, the capacitor wiring, and the island shape source wiring; and
- forming a connection electrode on the second insulating film, connected to the island shape source wiring and to the first semiconductor layer; and a pixel electrode overlapping the island shape source wiring.

34. A method according to claim 33, wherein the second insulating film is composed of a lamination film of: a first insulating layer having silicon as a constituent; and a second insulating layer made from an organic resin material.

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35. A method according to claim 33, wherein the second insulating film is composed of a lamination film of: a first insulating layer made from silicon oxide, silicon nitride, or silicon nitride oxide; and a second insulating layer made from polyimide, acrylic, polyamide, polyimide amide, or benzocyclobutene.

36. A method of manufacturing a semiconductor device having a liquid crystal sandwiched between a pair of substrates, comprising steps of:

forming a first semiconductor layer and a second semiconductor layer, made of crystalline semiconductor films, on a first substrate;

5 forming a first insulating film on the first semiconductor layer and on the second semiconductor layer;

10 forming a gate wiring on the first insulating film, overlapping the first semiconductor layer; a capacitor wiring on the first insulating film, positioned over the second semiconductor layer; and an island shape source wiring on the first insulating film;

15 forming a second insulating film covering the gate wiring, the capacitor wiring, and the island shape source wiring;

15 forming: a connection electrode on the second insulating film, connected to the island shape source wiring and to the first semiconductor layer; and a pixel electrode overlapping the island shape source wiring;

20 forming, on the second substrate, a red color filter, a blue color filter, and a green color filter corresponding to each pixel electrode, and for simultaneously forming a light shielding film, composed of a lamination film of the red color filter and the blue color filter, so as to overlap with at least the first semiconductor layer; and

bonding the first substrate to the second substrate.

37. A method according to claim 36, wherein the second insulating film is composed of a lamination film of: a first insulating layer having silicon as a constituent; and a second insulating layer made from an organic resin material.

38. A method according to claim 36, wherein the second insulating film is composed of a lamination film of: a first insulating layer made from silicon oxide, silicon nitride, or silicon nitride oxide; and a second insulating layer made from polyimide, acrylic, polyamide, polyimide amide, or benzocyclobutene.

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39. A method of manufacturing a semiconductor device, comprising steps of:  
forming a first semiconductor layer and a second semiconductor layer, made  
of crystalline semiconductor films, on an insulating surface;

10 forming a first insulating film on the first semiconductor layer and on the  
second semiconductor layer;

15 forming, on the first insulating film: a first electrode overlapping the first  
semiconductor layer; a second electrode overlapping the second semiconductor layer;  
and a source wiring;

20 forming a second insulating film covering the first electrode, the second  
electrode, and the source wiring; and

25 forming, on the second insulating film: a gate wiring connected to the first  
electrode; a connection electrode connected to the first semiconductor layer and to the  
source wiring; and a pixel electrode overlapping the source wiring.

40. A method according to claim 39, wherein the second semiconductor layer  
connected to the pixel electrode overlaps the second electrode connected to a gate  
wiring of an adjacent pixel, sandwiching the first insulating film therebetween.

41. A method according to claim 39, wherein the second insulating film is  
25 composed of a lamination film of: a first insulating layer having silicon as a

constituent; and a second insulating layer made from an organic resin material.

42. A method according to claim 39, wherein the second insulating film is composed of a lamination film of: a first insulating layer made from silicon oxide, silicon nitride, or silicon nitride oxide; and a second insulating layer made from polyimide, acrylic, polyamide, polyimide amide, or benzocyclobutene.  
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43. A method of manufacturing a semiconductor device having a liquid crystal sandwiched between a pair of substrates, comprising steps of:

10 forming a first semiconductor layer and a second semiconductor layer, made of crystalline semiconductor films, on a first substrate;

forming a first insulating film on the first semiconductor layer and on the second semiconductor layer;

15 forming, on the first insulating film: a first electrode overlapping the first semiconductor layer; a second electrode overlapping the second semiconductor layer; and a source wiring;

forming a second insulating film covering the first electrode, the second electrode, and the source wiring;

20 forming, on the second insulating film: a gate wiring connected to the first electrode; a connection electrode connected to the first semiconductor layer and to the source wiring; and a pixel electrode overlapping the source wiring;

25 forming, on the second substrate, a red color filter, a blue color filter, and a green color filter corresponding to each pixel electrode, and for simultaneously forming a light shielding film, composed of a lamination film of the red color filter and the blue color filter, so as to overlap with at least the first semiconductor layer; and

bonding the first substrate to the second substrate.

44. A method according to claim 43, wherein the second insulating film is composed of a lamination film of: a first insulating layer having silicon as a 5 constituent; and a second insulating layer made from an organic resin material.

45. A method according to claim 43, wherein the second insulating film is composed of a lamination film of: a first insulating layer made from silicon oxide, silicon nitride, or silicon nitride oxide; and a second insulating layer made from 10 polyimide, acrylic, polyamide, polyimide amide, or benzocyclobutene.

46. A method of manufacturing a semiconductor device, comprising the steps of:

forming a semiconductor layer on an insulating surface;

15 forming an insulating film on the semiconductor layer;

forming a first conductive layer and a second conductive layer on the insulating film;

adding an impurity element which imparts one conductivity, using the first 20 conductive layer and the second conductive layer as a mask, forming a first impurity region;

etching the first conductive layer and the second conductive layer, forming a first conductive layer having a tapered portion and a second conductive layer having a tapered portion; and

25 adding an impurity element which imparts one conductivity into the semiconductor layer through the insulating film, forming a second impurity region, and

simultaneously adding an impurity element which imparts one conductivity into the semiconductor layer, through the tapered portion of the first conductive layer, forming a third impurity region in which the impurity concentration increases toward an edge portion of the semiconductor layer.

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47. A method of manufacturing a semiconductor device, comprising the steps of:

forming a semiconductor layer on an insulating surface;

forming an insulating film on the semiconductor layer;

10 forming a first conductive layer and a second conductive layer on the insulating film;

15 adding an impurity element which imparts one conductivity, using the first conductive layer and the second conductive layer as a mask, forming a first impurity region;

20 etching the first conductive layer, the second conductive layer, and the insulating film, forming a first conductive layer having a tapered portion and a second conductive layer having a tapered portion, and an insulating film having a portion of the tapered portion; and

25 adding an impurity element which imparts one conductivity into the semiconductor layer, through the insulating film having a portion of the tapered portion, forming a second impurity region; and simultaneously adding an impurity element which imparts one conductivity into the semiconductor layer, through the tapered portion of the first conductive layer, forming a third impurity region in which the impurity concentration increases toward an edge portion of the semiconductor layer.